ELECTRICAL ENGINEERING MASTER OF SCIENCE

Leading to a Master of Science Degree in Electrical Engineering

The Master of Science in Electrical Engineering (MSEE) program is designed to provide advanced experience with post-graduate electrical engineering principles and skills. The program has a thesis option with 31 required credit hours, and a non-thesis option with 34 required credit hours. Either option has the students undertake an individualized engineering development experience, either as a two-course Thesis, or a one-course Master Project. All students are required to complete a one-credit Professional Perspectives course to increase exposure to recent developments and to aspects of professionalism. All students are required to complete a three-course concentration, either one of the predefined concentrations or an individualized concentration. Students may be either full-time or part-time. Although some classes or parts of classes may be able to be remote, the program is designed as an on-campus program. Some of laboratory exercises require use of physical apparatus in the labs, so students will need to be on-campus for those courses. The expected background of the students is a bachelor's degree in electrical engineering or another engineering bachelor's degrees that included a significant component of electrical engineering (DC and AC circuits, analog and digital electronics, and signal processing). Certain of the concentration or elective courses may have additional expected background related to their field. The transcripts of incoming students will be reviewed to determine whether foundation or prerequisite courses are required or recommended. If a student has been required or recommended to take such a course, a maximum of two graduate-level foundation courses may be applied as elective courses toward the requirements for the MSEE degree. Full-time students may complete the program in two or three semesters (within one calendar year), depending on how many graduate-level engineering courses were transferred in (maximum of six credits), and whether the thesis or non-thesis option is chosen. Part-time students may complete the program in two to four years, depending on transfer credits, the choice of the thesis or non-thesis option, course load per semester, and whether courses are taken during the summer semester.

Program Educational Outcomes

Program educational objectives are the accomplishments graduates are expected to achieve during the first few years after graduation with the M.S. degree.

Graduates with an M.S. in Electrical Engineering will have the following behavioral characteristics.

- Work toward alleviating problems, challenges or risks in application fields related to electrical engineering.
- Apply engineering methodology with confidence and humility to develop innovative and effective solutions in a professional and ethical manner.
- Pursue professional development to meet and adapt to emerging and evolving engineering challenges.

Student Outcomes

In order to fulfill its Mission, Wentworth has established the following Graduate Student Learning Outcomes. The Office of Institutional Effectiveness at WIT developed these Outcomes to be suitable for all graduate programs at WIT. These Outcomes were considered appropriate for the proposed program and were adopted.

Upon graduation, Wentworth Institute of Technology Graduate students will demonstrate:

- Core Knowledge: advanced knowledge in a specialized area consistent with the focus of their graduate program, including critical thinking and problem solving
- Scholarly Communication: advanced proficiency in written and oral communication, appropriate to purpose and audience.
- Professionalism: advanced intellectual and organizational skills of professional practice, including ethical conduct.
- Research Methods and Analysis: quantitative and qualitative skills in the use of data gathering methods and analytical techniques used in typical research that is consistent with the focus of their graduate programs

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Thesis Option

Course	Title	Credits
Mathematics Requirement		
MATH5800	MATHEMATICAL METHODS	3
or		
ELEC5850	ENGINEERING NUMERICAL METHODS	3
Management Requirement		
MGMT7175	ENGINEERING INNOVATION & ENTREPRENEURSHIP	3
or		
MGMT7100	PROJECT MANAGEMENT APPLICATIONS	3
Professional Perspectives Requirement		
ENGR7101	PROFESSIONAL PERSPECTIVES	1
Graduate Concentration Electives Requirement		
Graduate Electives: 6 three credit courses		18
ELEC 5000 or 6000 Level courses or other gradute courses with advisor's permission.		
THESIS OPTION		
ENGR7100	THESIS I	3
ENGR7200	THESIS II	3
TOTAL CREDITS		31

Non-Thesis Option

Course	Title	Credits
Mathematics Requirement		
MATH5800	MATHEMATICAL METHODS	3

Course	Title	Credits
or		
ELEC5850	ENGINEERING NUMERICAL METHODS	3
Management Requirement		
MGMT7175	ENGINEERING INNOVATION & ENTREPRENEURSHIP (or)	3
or		
MGMT7100	PROJECT MANAGEMENT APPLICATIONS	3
Professional Perspective Requirement		
ENGR7101	PROFESSIONAL PERSPECTIVES	
Project Requirement		
ENGR7000	MASTER PROJECT	3
Graduate Concentration Electives Requirement		
Graduate Electives: 8 three-credit courses		24
ELEC 5000 or 6000 Level courses or other gradute courses with advisor's permission.		
TOTAL CREDITS		34

For students with unrelated undergraduate degree, the following foundation courses may be required or recommended. ELEC5550 DIGITAL SIGNAL PROCESSING (3 credits) ELEC5520 FOUNDATIONS IN SIGNALS AND SYSTEMS (3 credits) DATA6000 APPLIED STATISTICS FOR RESEARCH (3 credits)

Concentrations

The program offers three structured concentrations and one individualized concentration. A student is required to complete one concentration. To fulfill a concentration, the student is required to:

- Complete three of the courses listed with the concentration.
- Complete a thesis or master project that relates to a field of the concentration.

A student may take more than three of the listed courses for the concentration, and any completed extra courses would be counted as electives. A student may attempt to complete two concentrations. The student would need to complete three unique courses per concentration (no course could be counted as one of the three courses for both concentrations). The thesis or master project would need to be related to a field of both concentrations. The concentrations and associated courses are listed below. ELEC courses at the 5000 level do not have a graduate-level prerequisite. ELEC courses at the 6000 level may have a graduate-level prerequisite.

Course	Title	Credits
POWER AND ENERGY CONCENTRATION		
ELEC5825	ELECTRICAL BUILDING SYSTEMS	3
ELEC5560	POWER SYSTEMS ANALYSIS I	3
ELEC5660	POWER SYSTEMS ANALYSIS II	3
ELEC6125	RENEWABLE ENERGY INTEGRATION	3

Course	Title	Credits
ROBOTICS AND PROCESS AUTOMATION CONCENTRATION		
ELEC5700	ROBOTICS & AUTOMATION SYSTEMS	3
ELEC5725	MACHINE PERCEPTION & COGNITION	3
ELEC5750	INDUSTRIAL CONTROLS	3
ELEC6200	CYBER-PHYSICAL SYSTEMS	3

Course	Title	Credits
ELECTORMAGNETICS AND MICROWAVE SENSING CONCENTRATION		
ELEC5900	INTRODUCTION TO RADAR SYSTEMS	3
ELEC5925	INTRODUCTION TO MICROWAVE IMAGING	3
ELEC5950	ANTENNA THEORY	3
ELEC6300	MICROWAVE ENGINEERING	3

Course	Title	Credits
INDIVIDUALIZED CONCENTRATION		
Students who wish to pursue an Individualized Concentration may submit a proposal to the graduate committee of the program for review. The proposal would include a rational, the name of the concentration and the required courses.		